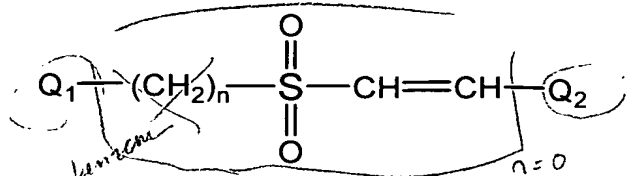


## CLAIMS

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1. A method for protecting an animal from cytotoxic side effects of the administration of a mitotic phase cell cycle inhibitor or a topoisomerase inhibitor comprising administering to the animal, in advance of administration of said inhibitor, an effective amount of at least one cytoprotective  $\alpha,\beta$  unsaturated aryl sulfone compound.

2. A method according to claim 1 wherein the cytoprotective compound has the formula I:



wherein:

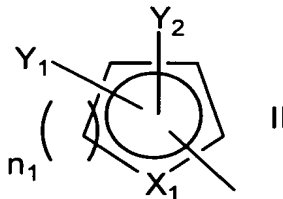
n is one or zero;

Q<sub>1</sub> and Q<sub>2</sub> are, same or different, are substituted or unsubstituted aryl; or

a pharmaceutically acceptable salt thereof.

3. The method according to claim 2 wherein:

Q<sub>1</sub> is selected from the group consisting of substituted and unsubstituted phenyl, 1-naphthyl, 2-naphthyl, 9-anthryl and an aromatic radical of formula II:

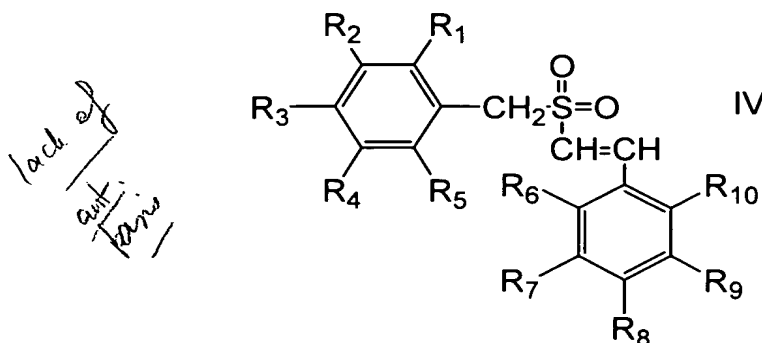


wherein



- 57 -

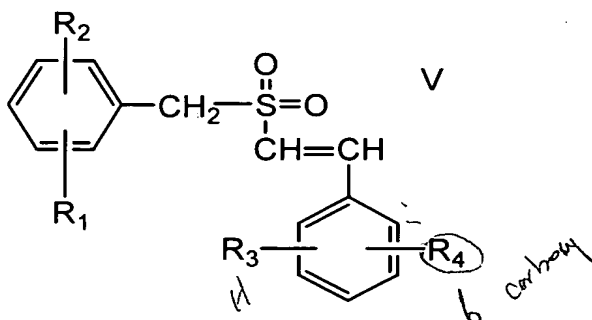
5. A method according to claim 4 wherein the cytoprotective compound has the formula IV:



wherein:

R<sub>1</sub> through R<sub>10</sub> are independently selected from the group consisting of hydrogen, halogen, C1-C8 alkyl, C1-C8 alkoxy, nitro, cyano, carboxy, hydroxy, phosphonato, amino, sulfamyl, acetoxo, dimethylamino(C2-C6 alkoxy), C1-C6 trifluoroalkoxy and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

6. The method according to claim 4 wherein the cytoprotective compound has the formula V:



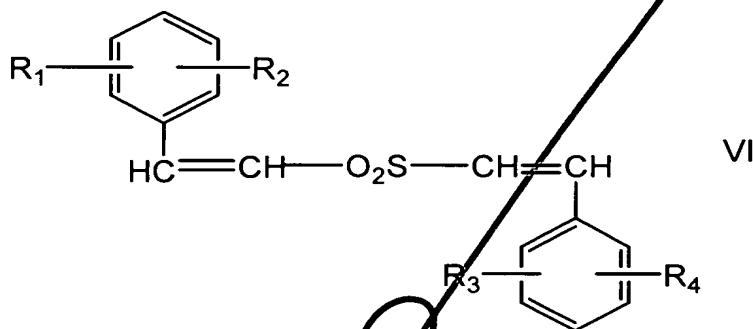
wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, halogen, C1-C8 alkyl, C1-C8 alkoxy, nitro, cyano, carboxy, hydroxy and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

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- 58 -

7. The method of claim 6 wherein the cytoprotective compound is selected from the group consisting of (E)-4-fluorostyryl-4-chlorobenzylsulfone; (E)-2-chloro-4-fluorostyryl-4-chlorobenzylsulfone; (E)-4-chlorostyryl-4-chlorobenzylsulfone; (E)-4-carboxystyryl-4-chlorobenzylsulfone; and (E)-4-fluorostyryl-2,4-dichlorobenzylsulfone.

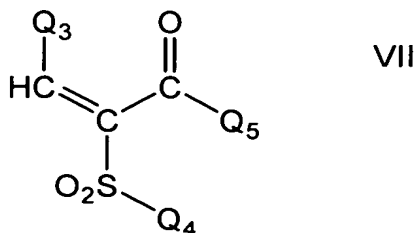
8. The method according to claim 1 wherein the cytoprotective compound is according to formula VI:



wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are independently selected from the group consisting of hydrogen, halogen, C1-C8 alkyl, C1-C8 alkoxy, nitro, cyano, carboxy, hydroxy and trifluoromethyl;  
or a pharmaceutically acceptable salt thereof.

9. The method according to claim 1 wherein the cytoprotective compound is according to formula VII:



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~~Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> are independently selected from the group consisting of phenyl and mono-, di-, tri-, tetra- and penta-substituted phenyl where the substituents, which may be the same or different, are independently selected from the group consisting of halogen, C1-C8 alkyl, C1-C8 alkoxy, nitro, cyano, carboxy, hydroxy, phosphonato, amino, sulfamyl, acetoxy, dimethylamino(C2-C6 alkoxy), C1-C6 trifluoroalkoxy and trifluoromethyl; or a pharmaceutically acceptable salt thereof.~~

VIIa

R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen, halogen, C1-C8 alkyl, C1-8 alkoxy, nitro, cyano, carboxy, hydroxy, and trifluoromethyl; and

17. The method of claim 10 wherein the cytoprotective compound is 2-(phenylsulfonyl)-1-phenyl-3-(4-fluorophenyl)-2-propen-1-one.

12. The method of claim 1 wherein the cytoprotective compound is of the Z-configuration.

13. The method according to claim 1 wherein the cytoprotective compound is administered at least about 4 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

14. The method according to claim 13 wherein the cytoprotective compound is administered at least about 12 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

15. The method according to claim 14 wherein the cytoprotective compound is administered at least about 24 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

16. The method according to claim 13 wherein the mitotic phase cell cycle inhibitor is selected from the group consisting of vinca alkaloids, taxanes, naturally occurring macrolides, and colchicine and its derivatives; and the topoisomerase inhibitor is selected from the group consisting of camptothecin, etoposide and mitoxantrone.

17. The method according to claim 16 wherein the mitotic phase cell cycle inhibitor is selected from the group consisting of paclitaxel and vincristine.

18. A method for treating cancer or other proliferative disorder comprising administering to an animal an effective amount at least one cytoprotective  $\alpha,\beta$  unsaturated aryl sulfone compound followed by an effective amount of at least one mitotic phase cell cycle inhibitor or topoisomerase inhibitor after administration of the cytoprotective  $\alpha,\beta$  unsaturated aryl sulfone compound.

- 61 -

19. The method according to claim 18 wherein the cytoprotective compound is administered at least about 4 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

20. The method according to claim 19 wherein the cytoprotective compound is administered at least about 12 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

21. The method according to claim 20 wherein the cytoprotective compound is administered at least about 24 hours before administration of the mitotic phase cell cycle inhibitor or topoisomerase inhibitor.

22. The method of claim 18 wherein the cytoprotective compound is selected from the group consisting of: (E)-4-fluorostyryl-4-chlorobenzylsulfone; (E)-2-chloro-4-fluorostyryl-4-chlorobenzylsulfone; (E)-4-chlorostyryl-4-chlorobenzylsulfone; (E)-4-carboxystyryl-4-chlorobenzylsulfone; and (E)-4-fluorostyryl-2,4-dichlorobenzylsulfone.

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